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(54) Straight edge for guiding power tools

(57) A straight edge 11 provided with means 12 to clamp the straight edge to a working surface is characterised by the provision of at least two scales 13 each of which, in use, can be caused to project from the working edge of the straight edge to reach the already-marked intended line of cut 25 in a sheet of wood or other workpiece, and thereby enable the straight edge to be aligned accurately in spaced parallelism with the line of cut before being clamped to the workpiece and/or to a surface supporting the workpiece; and each of the scales 13 can then be removed from or stowed on the straight edge to allow unimpeded travel of the base plate of a saw or other power tool along the working edge of the straight edge to cut the workpiece.

Figure 1

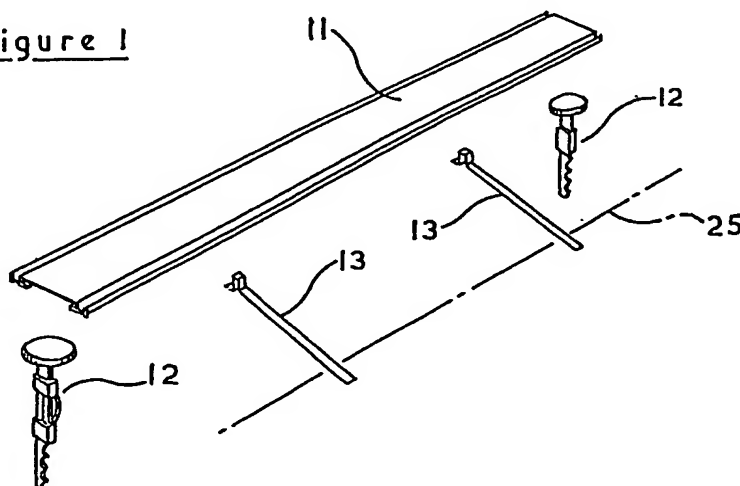
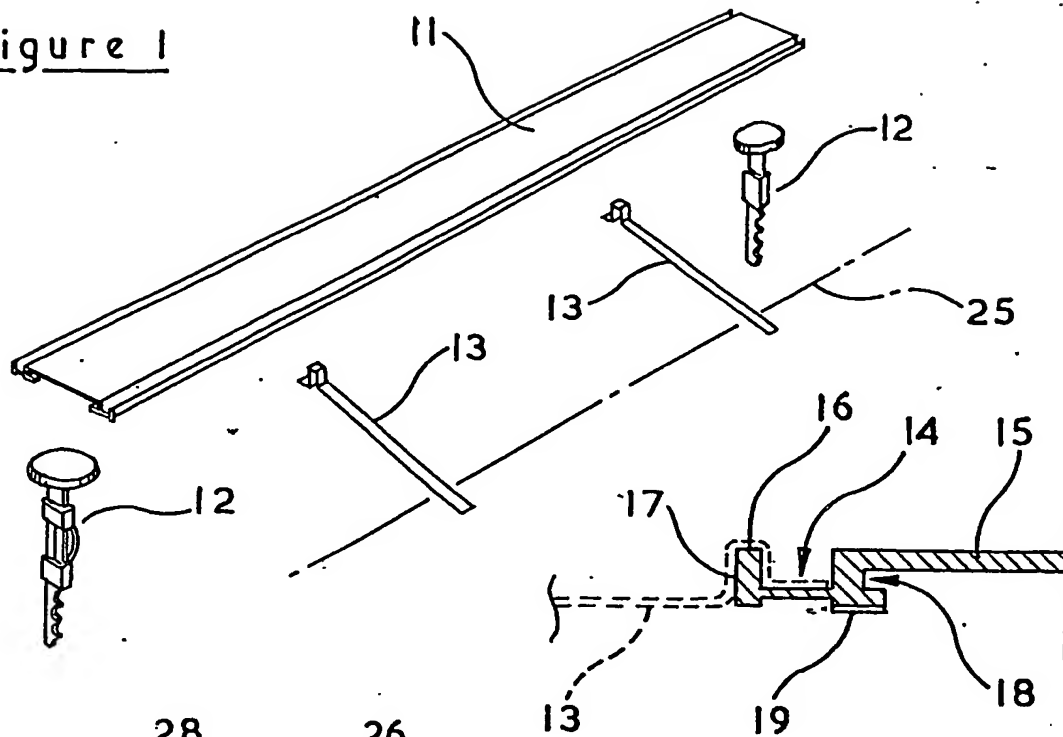
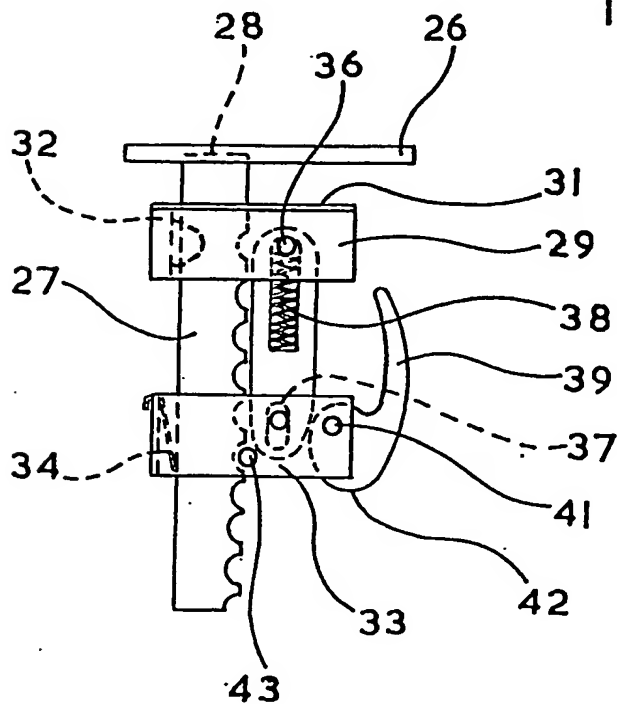
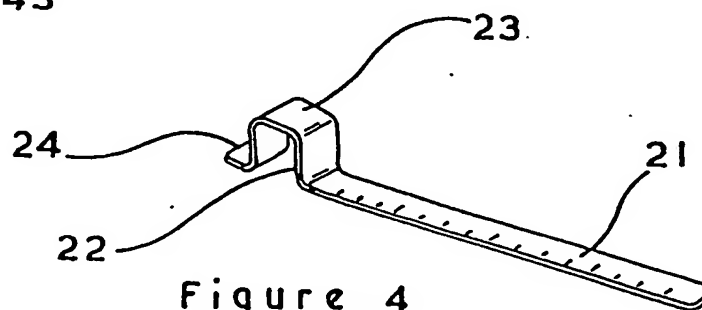


Figure 1Figure 2Figure 3Figure 4

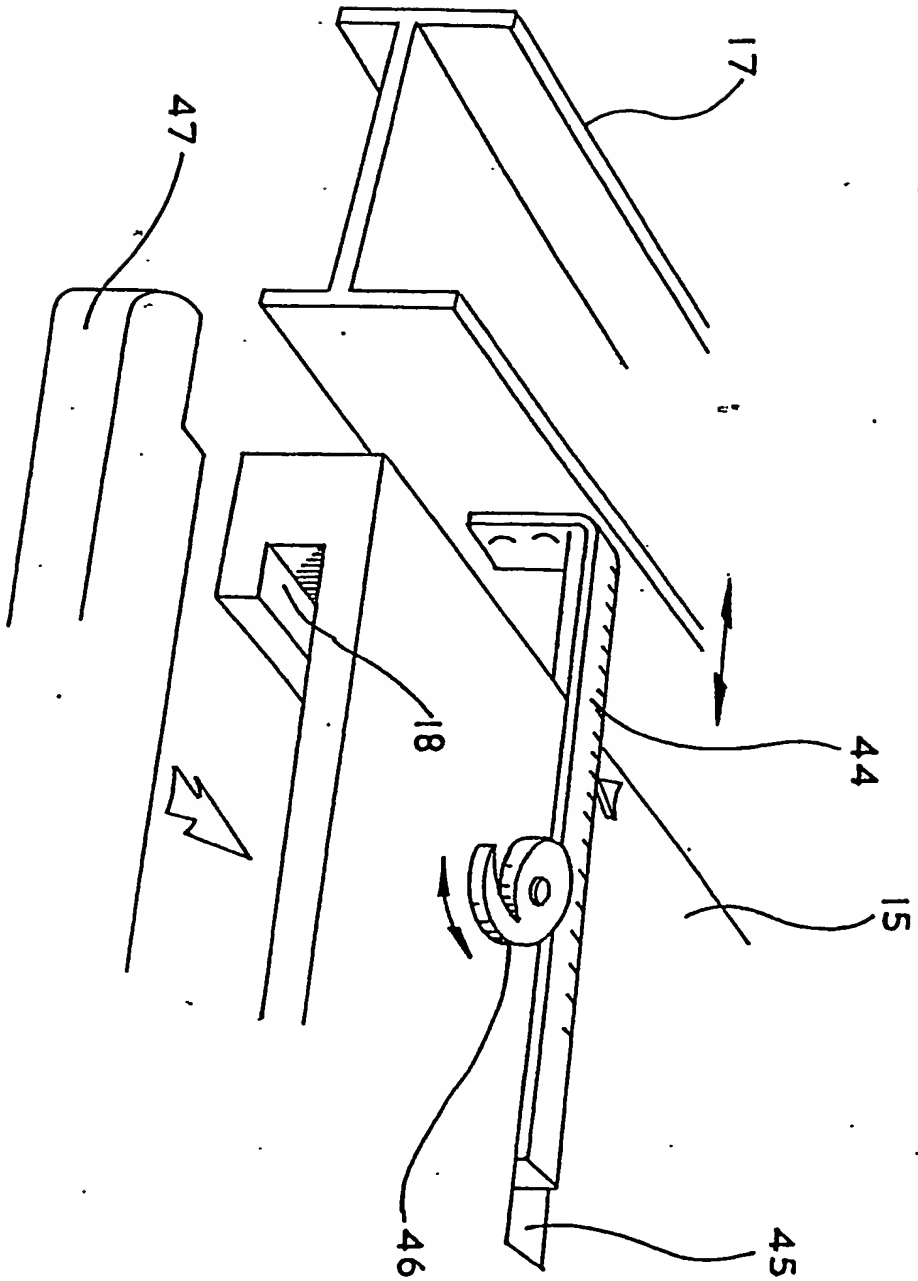


Figure 5

SPECIFICATION

Straight edge for guiding power tools

5 *Field of the invention*

The invention relates to a straight edge for guiding power tools, for example power-driven portable circular saws of the kind in widespread use amongst "do it yourself" enthusiasts and typified by the saws currently marketed in the United Kingdom by Black & Decker Limited and driven by fractional horse power electric motor.

Background to the invention

15 The problem which the invention is intended to solve arises when cutting sheets of wood with a portable power saw of the Black & Decker kind. These saws, run on a base plate which moves along the sheet to follow the line of cut. Conventionally, the "stand-off" distance from the blade to the edge of the base plate is marked on the sheet; a straight edged beam of wood is clamped to the sheet so that its straight edge runs at this distance from the intended line of cut and parallel to that line; and the cut is made by running the edge of the saw base plate along the straight edge of the beam and hence guiding the saw through the sheet along the intended line of cut.

The drawbacks of this method are that a spare beam with a straight edge always has to be kept handy; the beam needs to be taken care of, and its edge preserved, and this is not always likely to happen; the beam can warp with time and in poor storage conditions; separate clamps have to be kept handy to clamp the beam to the sheet; packing has to be used if the surface of the sheet is not to be damaged; and the intended line of cut has to be first measured off and then drawn between the measured-off markings.

The only relevant art known to the applicant is a straight edge which incorporates means to clamp the straight edge to the bench or other working surface supporting the sheet during sawing. This edge is marketed in the United Kingdom by mail order by the company Toolmail (1982) Limited of 7 London Road, Sevenoaks, Kent TN13 1AH under the model designation Hirsh TCE-96 Cutters Edge and is described and illustrated at page 22 of the 1985 Toolmail mail order catalogue. The means to clamp the straight edge to the bench are secured to the underside of the straight edge, and the straight edge is not a wooden beam. In these respects, the straight edge incorporates means to prevent it from moving inadvertently on the bench under pressure from the travelling saw; and it also will not warp or be as easily damaged as the simple wooden beams referred to above.

55 This Hirsh straight edge still, however, incorporates no means to align it in accurately spaced parallelism with the intended line of cut.

Summary of the invention

60 The invention in its broadest aspect is embodied in a straight edge, with means to clamp the straight edge to a working surface, and characterised by the provision of at least two scales each of which, in use, can be caused to project from the working edge of the straight edge to reach the already-marked intended

line of cut in a sheet of wood or other workpiece, and thereby enable the straight edge to be aligned accurately in spaced parallelism with the line of cut before being clamped to the workpiece and/or to a surface supporting the workpiece; and each of which scales can then be removed from or stowed on the straight edge to allow unimpeded travel of the base plate of the saw or other power tool along the working edge of the straight edge to cut the workpiece.

75 The scales incorporate means which positively cooperate with the straight edge when the scales are initially caused to project from the working edge of the straight edge in order to align and space that working edge from the intended line of cut, even though the scales may be wholly removed from the straight edge and stowed elsewhere before cutting subsequently commences.

In other words, the invention is not to be construed so broadly as to embody a combination of the known Hirsh Cutters Edge with two conventional rulers.

The scales may for example each have one end which is hooked so as to engage a projection and/or a recess formed adjacent the working edge of the straight edge, with the intention that once the scales have been used they can simply be unhooked and stowed elsewhere until they are next needed. This has the merit of simplicity and there are no working parts to go wrong.

Alternatively the scales may fold into the straight edge, by pivoting and/or sliding and/or telescoping. There would then be less chance of them being lost in a typical workshop.

The scales may, in manner similar to that of a conventional ruler, be marked with measures; but they could alternatively or additionally have a scale surface so constituted that any individual user of the invention could mark the "stand-off" distances of his own various power tools on the scale surfaces, with or without the aid of premarked measurements.

105 These surfaces of the scales may for example be so constituted as to accept readily a pencil or pen marking, and may with particular advantage be so constituted that any such marking, whilst virtually permanent in normal intended use, could be removed to take into account the changing nature of the stock of tools held by individual users.

The clamping means may with advantage have a "wedge-locking" clamping action. Clamping means with this action are known in themselves, and have the advantage of being quickly and easily clamped and unclamped by an essentially straightforward lever-action operation as opposed to having to be screwed into and out of their clamped position. It is particularly advantageous, and it is thought to be new and to involve an inventive step, to apply this known species of clamp to a straight edge embodying the invention.

Where the clamping means operate with a wedging clamping action, as just envisaged, and in order to reduce the danger of damage to either surface of the sheet and/or the surface supporting the sheet, it is preferred that the mechanism imparting the clamping movement incorporates a spring which, as the clamp is applied, cushions the force with which the clamping jaw grips the clamped surface. Any such

spring-cushioned mechanism will of course be so arranged that the clamp still fulfills adequately its primary clamping function.

In one embodiment of the invention, to be described and illustrated in this specification, the working edge of the straight edge is not formed integrally with the rest of the main body of the straight edge; but instead is initially formed separately and is linked to the main body of the straight edge by means which allow the working edge to be extended from and retracted back to the main body. This has the advantage that, when cutting a groove for example in a workpiece, the straight edge can be used to guide the base plate of the saw or other tool without it being necessary to unclamp the main body of the straight edge from the workpiece in between one cut and the second cut.

Preferably, in embodiments having the feature just outlined, the working edge extends and retracts without altering its attitude in relation to the longitudinal axis of the main body of the straight edge. This is preferred for the reason that the use of the extensible and retractable straight edge will overwhelmingly be to cut successive lines in parallelism with one another.

An extensible and retractable straight edge, where embodied in the invention, is again preferably held in its extended positions by clamping means having a wedging clamping action.

The underside of the straight edge, and the surfaces of the clamping means which is use will grip the underside of the sheet and/or of a surface supporting the sheet, may with advantage be coated with slip-resistant material. This does away with the need for packing strips to protect the sheet surfaces. It minimises the danger of damage to either surface of the sheet, even without such packing strips.

The clamping means may also advantageously have a cushioned clamping action, for the same reason as that just outlined; and in this case it is particularly advantageous to use a slip-resistant surface for the underside of the straight edge and for the jaws of the clamping means.

Preferably there are two individual clamping means, one to clamp each opposite end region of the straight edge, just as there are at least two scales; and it is also preferred that the scales and the clamping means are all freely adjustable along substantially the entire length of the straight edge.

In one current embodiment of the invention, to be described and illustrated in this specification, there are two scales and two individual clamps, and all are respectively separate entities. A scale may however be combined with a clamp in certain embodiments.

Brief description of the drawings

The accompanying drawings show by way of example one embodiment of the invention. This is not necessarily the best way of putting the invention into practice, but it is the best of those currently known to the applicant and now reduced to practice. It will now be described with reference to the drawings, in which:

Figure 1 shows the straight edge diagrammatically and in perspective, and, and drawn to a scale reduced

in comparison with the other figures of the drawings;

Figure 2 shows the main body of the straight edge in transverse section, whilst Figures 3 and 4 show respectively a clamp and a scale forming part of the straight edge; and

Figure 5 shows the essential features of an alternative edge.

Description of the preferred embodiment

The main body of a straight edge shown in Figure 1 is referenced generally 11 and is linear, elongate and free from any warping along its length. As shown, the body is rectangular in plan, and it is of constant cross section. It may be made in metal or in tough hard plastic, or in wood or any other material suited to its intended use. It carries two clamps 12 and two scales 13, all of which can slide along the whole of the length of the body 11, and can be wholly removed from the body 11, independently of one another.

Although the body 11 is illustrated as a single length of material, it could comprise two telescoped lengths and so increase its versatility. The details of how to construct a suitably telescoping body such as the body 11 can readily be supplied without further inventive thought by the intended skilled addressee of this specification.

Figure 2 shows the constant cross section of the body 11. A recess 14 is created between the main flat top portion 15 and the peripheral flat top portion 16 of the body. The working edge 17 of the straight edge (i.e. the edge along which the base plate of the saw or other power tool travels in use) adjoins the recess 14.

Another recess 18 is created along the underside of the body 11 of the straight edge, beneath the flat top portion 15 and inboard of the recess 14.

Figure 2 shows one half of the cross section of the body 11. The other half is a mirror image of it and has similarly formed and positioned recesses corresponding to the recesses 14 and 18 shown in Figure 2. All these recesses extend along the whole of the length of the body 11, and each of the recesses is open at each of its opposite ends.

The clamps 12 engage simultaneously in the opposed recesses 18 of the body 11, whilst the scales 13 engage the recess 14 adjoining the working edge 17 of the straight edge. Because the recesses are open-ended, the clamps and the scales can be freely inserted into and removed from the body 11. Once the clamps 12 are inserted into their recesses 18, they are held in the body 11 (although they can be adjusted, when not in clamping mode, up and down that body's length).

The body 11 in use rests with its underside firmly on the sheet of wood or other workpiece to be cut by the power tool. A slip-resistant coating 19 of a rubberised solution is therefore provided. This coating, as well as resisting any tendency of the body 11 to slide on the workpiece once it has been clamped into place, also helps to prevent the workpiece from being marked. Proprietary coatings or preformed strips of material which would be suitable will occur to the skilled reader.

Each scale 13 as shown in Figure 4 is of relatively simple construction and is, in this particular embodiment, bent up from metal strip. One of its surfaces is

marked with graduations 21 in a manner similar to that of a conventional ruler. Its end is hooked, and is so proportioned that the flank 22 of the hook abuts the working edge 17 of the body 11 in use whilst the base 5 23 of the hook sits on the surface 16 of the body; and the tail 24 of the hook engages the recess 14, all as shown in broken line in Figure 2.

Each scale 13 can thus be firmly engaged adjacent the working edge 17 of the straight edge, at any point 10 along the length of that working edge, and the two scales can be used to space the body 11 in accurate parallelism with the intended line of cut - referenced 25 in Figure 1 - already marked on the sheet work-piece.

15 Figure 3 now illustrates one specific form of clamp 12 for use with the body 11 and the scales 13. Other forms of clamp could be used. The one illustrated is only by way of example, although in general it is preferred that any clamping has a wedging clamping 20 action as does the clamp of Figure 3.

The head 26 of the clamp is circular. Diametrically opposite regions of its periphery engage respectively in each of the recesses 18 in the body 11, so that the clamp can slide up and down the length of the body 25 whilst being retained on the body when not in clamping mode. A stem 27 is essentially an elongate rectangular bar of constant cross section and is joined to the head 26 by a pin 28 which allows the stem 27, and the parts carried by the stem, to pivot into substantially 30 the same plane as the plane of the flat circular head 26 from the position, shown in Figure 3, where the stem 27 and the parts carried by the stem depend from the head 26 and occupy a plane substantially at right angles to the plane of the head.

35 A jaw 29 in the form of a rectangular block slides up and down the stem 27. The clamping face of the jaw 29 is coated with a slip-resistant coating 31 identical to the coating 19 on the underside of the body 11. The through-aperture 32 which enables the clamping jaw 40 29 to slide up and down the stem 27 also allows the jaw 29 a limited amount of sideways float, as Figure 3 shows.

Another block 33 is freely slidable up and down the stem 27 and again has allowance for float. A leaf 45 spring 34 acts between the block 33 and one straight edge of the stem 27. A link 35 is pivoted at one end 36 to the jaw 29 and at its other end incorporates a lost motion connection 37 securing it to the block 33.

A coiled compression spring 38 is housed in a cut- 50 out in the link 35 and acts between one end of the cutout and the underside of the pin 36. A handle 39 is pivoted at 41 to the block 33 and is so shaped that, when the handle is turned clockwise when viewed as in Figure 3, a base region 42 of the handle acts as a 55 cam on the rounded surface of the adjacent end of the link 35 and pushes the link 35 upwards (i.e. against the action of spring 38) to take up the lost motion connection in the link between block 33 and jaw 29.

The edge of stem 27 parallel with the edge against 60 which the leaf spring 34 operates is crenellated, as shown. A pin 43 in block 33 engages individual ones of the crenellations, but the float inherent in block 33 (together with the pivoting action of link 35 allowed by pivot 36) enables block 33 to move to the right 65 when viewed as in Figure 3, and against the action of

spring 34, to bring pin 43 out of engagement with the crenellations.

Block 33 and hence jaw 29 can then be moved up stem 27 to trap a workpiece and/or a workpiece- 70 supporting surface between the two coatings 19 and 31, assuming the clamp to be in position in the body 11. Pin 43 is allowed to ride back into the nearest adjacent crenellation under the action of spring 34. Handle 39 is then turned clockwise when viewed as in 75 Figure 3, to push link 35 and hence jaw 29 hard against the underside of the workpiece and/or work-piece-supporting surface with what amounts to an essentially spring-cushioned action.

In Figure 5, the working edge 17 of the straight edge 80 is extensible and retractable in relation to the main body of the straight edge. Rigid legs 44 extend from the initially separately formed working edge portion 17 to slide in respective grooves 45 cut into the top surface 15 of the main body of the straight edge in 85 such a way that, as the legs slide along the grooves, the working edge 17 moves away from and back towards the main body. Wedge-action cam locks 46 can clamp the legs 44 against the sides of their respective grooves 45 to hold the legs, and hence the 90 working edge 17, in any one of a plurality of positions spaced from the main body of the straight edge.

Respective end blocks 47 fit into the recesses 18 in the main body, in this particular embodiment, once the clamps 12 have been inserted. The end blocks 47 95 can be a tight fit, and/or can be secured by screws, in a manner which forms no essential part of the present invention and which can be selected by the skilled reader.

Scale markings may be distributed along the length 100 of each of the legs 44, in a manner similar to the markings on the surface 21 of the measuring gauges.

CLAIMS

105 1. A straight edge, with means to clamp the straight edge to a working surface, and characterised by the provision of at least two scales each of which, in use, can be caused to project from the working edge of the straight edge to reach the already-marked 110 intended line of cut in a sheet of wood or other work-piece, and thereby enable the straight edge to be aligned accurately in spaced parallelism with the line of cut before being clamped to the workpiece and/or to a surface supporting the workpiece; and each of 115 which scales can then be removed from or stowed on the straight edge to allow unimpeded travel of the base plate of the saw or other power tool along the working edge of the straight edge to cut the work-piece.

120 2. A straight edge according to Claim 1 and in which the scales each have one end which is hooked so as to engage a projection and/or a recess formed adjacent the working edge of the straight edge such that, once the scales have been used, they can be 125 unhooked and stowed elsewhere until they are next needed.

3. A straight edge according to Claim 1 and in which the scales fold into the straight edge.

130 4. A straight edge according to any of the preceding Claims and in which the scales have surfaces so

constituted as to accept readily a pencil or pen marking.

5 5. A straight edge according to Claim 4 and in which the scale surfaces are so constituted that any such marking can be readily removed.

6. A straight edge according to any of the preceding Claims and in which the clamping means have a "wedge-locking" clamping action.

10 7. A straight edge according to Claim 6 and in which the mechanism imparting the clamping movement incorporates a spring which, as the clamp is applied, cushions the force with which the clamping jaw grips the clamped surface.

15 8. A straight edge according to any of the preceding Claims and in which the working edge of the straight edge is linked to the main body of the straight edge by means which allow the working edge to be extended from and retracted back to the main body.

20 9. A straight edge according to Claim 8 and in which the working edge extends and retracts without altering its attitude in relation to the longitudinal axis of the main body of the straight edge.

25 10. A straight edge according to Claim 8 or Claim 9 and in which the working edge is held in its extended positions by clamping means having a wedging clamping action.

30 11. A straight edge according to any of the preceding Claims and in which the jaw surfaces of the clamping means are coated with slip-resistant material.

12. A straight edge according to any of the preceding Claims and in which the scales and the clamping means are all freely adjustable along substantially the entire length of the straight edge.

35 13. A straight edge substantially as described herein with reference to and as illustrated in Figures 1, 2 and 4 of the accompanying drawings.

40 14. A straight edge according to Claim 13 and comprising clamping means substantially as described herein with reference to and as illustrated in Figure 3 of the accompanying drawings.

45 15. A straight edge according to Claim 13 or Claim 14 and comprising an extensible and retractable working edge substantially as described herein with reference to and as illustrated in Figure 5 of the accompanying drawings.

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